

WHAT IS CLAIMED IS:

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1. An operation method of an active matrix device comprising:  
a substrate having an insulating surface;  
a first signal line extending over said substrate;  
5 a first top-gate type thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;  
a second signal line extending across said first signal line wherein said second signal line is connected to a drain of said first thin film transistor;  
10 a second top-gate type thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;  
a voltage supply line formed over said substrate wherein said voltage supply line is connected to a drain of said second thin film transistor;  
15 a pixel electrode formed over said substrate wherein said pixel electrode is connected to a source of said second thin film transistor; and  
a driving circuit formed over said substrate for driving at least one of said first and second thin film transistors, said driving circuit comprising a third thin  
20 film transistor wherein a channel forming region of said third thin film transistor comprises crystalline silicon,  
said method comprising a step of applying a voltage from said voltage supply line to said pixel electrode for a period during one frame, wherein said period is determined in accordance with a desired tone of a display.
- 25 2. An operation method of an active matrix device comprising:  
a substrate having an insulating surface;  
a first signal line extending over said substrate;

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- a first bottom gate type thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;
- 5 a second signal line extending across said first signal line wherein said second signal line is connected to a drain of said first thin film transistor;
- a second bottom gate type thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;
- 10 a voltage supply line formed over said substrate wherein said voltage supply line is connected to a drain of said second thin film transistor;
- a pixel electrode formed over said substrate wherein said pixel electrode is connected to a source of said second thin film transistor; and
- 15 a driving circuit formed over said substrate for driving at least one of said first and second thin film transistors, said driving circuit comprising a third thin film transistor wherein a channel forming region of said third thin film transistor comprises crystalline silicon,
- said method comprising a step of applying a voltage from said voltage supply line to said pixel electrode for a period during one frame, wherein said period is determined in accordance with a desired tone of a display.
- 20
3. An operation method of an active matrix device comprising:
- a substrate having an insulating surface;
- a first signal line extending over said substrate;
- a first thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;
- 25 a second signal line extending across said first signal line wherein said second signal line is connected to a drain of said first thin film transistor;

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a second thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;

5 a voltage supply line formed over said substrate wherein said voltage supply line is connected to a drain of said second thin film transistor;

a pixel electrode formed over said substrate wherein said pixel electrode is connected to a source of said second thin film transistor; and

10 a driving circuit formed over said substrate for driving at least one of said first and second thin film transistors, said driving circuit comprising a third thin film transistor wherein a channel forming region of said third thin film transistor comprises crystalline silicon,

15 said method comprising a step of applying a voltage from said voltage supply line to said pixel electrode for a period during one frame, wherein said period is determined in accordance with a desired tone of a display.

4. An operation method of an active matrix device comprising:

a substrate having an insulating surface;

a first signal line extending over said substrate;

20 a first top-gate type thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;

a second signal line extending across said first signal line wherein said second signal line is connected to a drain of said first thin film transistor;

25 a second top-gate type thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;

a voltage supply line formed over said substrate wherein said voltage supply line is connected to a drain of said second thin film transistor;

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a surface smoothing film formed over said first and second thin film transistors;

a pixel electrode formed over said surface smoothing film wherein said pixel electrode is connected to a source of said second thin film transistor; and

5 a driving circuit formed over said substrate for driving at least one of said first and second thin film transistors, said driving circuit comprising a third thin film transistor wherein a channel forming region of said third thin film transistor comprises crystalline silicon,

10 said method comprising a step of applying a voltage from said voltage supply line to said pixel electrode for a period during one frame, wherein said period is determined in accordance with a desired tone of a display.

5. An operation method of an active matrix device comprising:

a substrate having an insulating surface;

a first signal line extending over said substrate;

15 a first bottom gate type thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;

a second signal line extending across said first signal line wherein said second signal line is connected to a drain of said first thin film transistor;

20 a second bottom gate type thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;

25 a voltage supply line formed over said substrate wherein said voltage supply line is connected to a drain of said second thin film transistor;

a surface smoothing film formed over said first and second thin film transistors;

a pixel electrode formed over said surface smoothing film wherein said pixel electrode is connected to a source of said second thin film transistor; and

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a driving circuit formed over said substrate for driving at least one of said first and second thin film transistors, said driving circuit comprising a third thin film transistor wherein a channel forming region of said third thin film transistor comprises crystalline silicon,

5                   said method comprising a step of applying a voltage from said voltage supply line to said pixel electrode for a period during one frame, wherein said period is determined in accordance with a desired tone of a display.

6.           An operation method of an active matrix device comprising:

a substrate having an insulating surface,

10           a first signal line extending over said substrate;

a first thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;

15           a second signal line extending across said first signal line wherein said second signal line is connected to a drain of said first thin film transistor;

a second thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;

20           a voltage supply line formed over said substrate wherein said voltage supply line is connected to a drain of said second thin film transistor;

a surface smoothing film formed over said first and second thin film transistors;

25           a pixel electrode formed over said surface smoothing film wherein said pixel electrode is connected to a source of said second thin film transistor; and

a driving circuit formed over said substrate for driving at least one of said first and second thin film transistors, said driving circuit comprising a third thin film transistor wherein a channel forming region of said third thin film transistor comprises crystalline silicon,

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said method comprising a step of applying a voltage from said voltage supply line to said pixel electrode for a period during one frame, wherein said period is determined in accordance with a desired tone of a display.

- 5           7.     An operation method of an active matrix device comprising:
- a substrate having an insulating surface;
- a first signal line extending over said substrate;
- a first top-gate type thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;
- 10           a second signal line extending across said first signal line wherein said second signal line is connected to a drain of said first thin film transistor;
- a second top-gate type thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;
- 15           a voltage supply line formed over said substrate wherein said voltage supply line is connected to a drain of said second thin film transistor;
- a pixel electrode formed over said substrate wherein said pixel electrode is connected to a source of said second thin film transistor; and
- 20           a driving circuit formed over said substrate for driving at least one of said first and second thin film transistors, said driving circuit comprising a third thin film transistor wherein a channel forming region of said third thin film transistor comprises crystalline silicon,
- 25           wherein a channel width of said second thin film transistor is larger than a channel width of said first thin film transistor,
- said method comprising a step of applying a voltage from said voltage supply line to said pixel electrode for a period during one frame, wherein said period is determined in accordance with a desired tone of a display.

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8. An operation method of an active matrix device comprising:  
a substrate having an insulating surface;  
a first signal line extending over said substrate;  
a first bottom gate type thin film transistor having a channel region  
5 comprising crystalline silicon formed over said substrate wherein a gate of said first  
thin film transistor is connected to said first signal line;  
a second signal line extending across said first signal line wherein  
said second signal line is connected to a drain of said first thin film transistor;  
a second bottom gate type thin film transistor having a channel region  
10 comprising crystalline silicon formed over said substrate wherein a signal is applied  
to a gate of said second thin film transistor from said second signal line through at  
least said first thin film transistor;  
a voltage supply line formed over said substrate wherein said voltage  
supply line is connected to a drain of said second thin film transistor;  
15 a pixel electrode formed over said substrate wherein said pixel  
electrode is connected to a source of said second thin film transistor; and  
a driving circuit formed over said substrate for driving at least one of  
said first and second thin film transistors, said driving circuit comprising a third thin  
film transistor wherein a channel forming region of said third thin film transistor  
20 comprises crystalline silicon,  
wherein a channel width of said second thin film transistor is larger  
than a channel width of said first thin film transistor,  
said method comprising a step of applying a voltage from said voltage  
supply line to said pixel electrode for a period during one frame, wherein said period  
25 is determined in accordance with a desired tone of a display.
9. An operation method of an active matrix device comprising:  
a substrate having an insulating surface;  
a first signal line extending over said substrate;

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5 a first thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;

5 a second signal line extending across said first signal line wherein said second signal line is connected to a drain of said first thin film transistor;

10 a second thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;

10 a voltage supply line formed over said substrate wherein said voltage supply line is connected to a drain of said second thin film transistor;

a pixel electrode formed over said substrate wherein said pixel electrode is connected to a source of said second thin film transistor; and

15 a driving circuit formed over said substrate for driving at least one of said first and second thin film transistors, said driving circuit comprising a third thin film transistor wherein a channel forming region of said third thin film transistor comprises crystalline silicon,

wherein a channel width of said second thin film transistor is larger than a channel width of said first thin film transistor,

20 said method comprising a step of applying a voltage from said voltage supply line to said pixel electrode for a period during one frame, wherein said period is determined in accordance with a desired tone of a display.

25 10. An operation method of an active matrix device comprising:  
a substrate having an insulating surface;  
a first signal line extending over said substrate;  
a first top-gate type thin film transistor having a channel region comprising crystalline silicon and a first pair of impurity regions formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;



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a second signal line extending across said first signal line wherein said second signal line is connected to one of said first pair of impurity regions of said first thin film transistor;

5 a second top-gate type thin film transistor having a channel region comprising crystalline silicon and a second pair of impurity regions formed over said substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;

10 a voltage supply line formed over said substrate wherein said voltage supply line is connected to one of said second pair of impurity regions of said second thin film transistor;

a pixel electrode formed over said substrate wherein said pixel electrode is connected to the other one of said second pair of impurity regions of said second thin film transistor; and

15 a driving circuit formed over said substrate for driving at least one of said first and second thin film transistors, said driving circuit comprising a third thin film transistor wherein a channel forming region of said third thin film transistor comprises crystalline silicon,

20 said method comprising a step of applying a voltage from said voltage supply line to said pixel electrode for a period during one frame, wherein said period is determined in accordance with a desired tone of a display.

11. An operation method of an active matrix device comprising:

a substrate having an insulating surface;

a first signal line extending over said substrate;

25 a first bottom gate type thin film transistor having a channel region comprising crystalline silicon and a first pair of impurity regions formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;

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a second signal line extending across said first signal line wherein said second signal line is connected to one of said first pair of impurity regions of said first thin film transistor;

5 a second bottom gate type thin film transistor having a channel region comprising crystalline silicon and a second pair of impurity regions formed over said substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;

10 a voltage supply line formed over said substrate wherein said voltage supply line is connected to one of said second pair of impurity regions of said second thin film transistor;

a pixel electrode formed over said substrate wherein said pixel electrode is connected to the other one of said second pair of impurity regions of said second thin film transistor; and

15 a driving circuit formed over said substrate for driving at least one of said first and second thin film transistors, said driving circuit comprising a third thin film transistor wherein a channel forming region of said third thin film transistor comprises crystalline silicon,

20 said method comprising a step of applying a voltage from said voltage supply line to said pixel electrode for a period during one frame, wherein said period is determined in accordance with a desired tone of a display.

12. An operation method of an active matrix device comprising:

a substrate having an insulating surface;

a first signal line extending over said substrate;

25 a first thin film transistor having a channel region comprising crystalline silicon and a first pair of impurity regions formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;

a second signal line extending across said first signal line wherein said second signal line is connected to one of said first pair of impurity regions of said first thin film transistor;

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a second thin film transistor having a channel region comprising crystalline silicon and a second pair of impurity regions formed over said substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;

5 a voltage supply line formed over said substrate wherein said voltage supply line is connected to one of said second pair of impurity regions of said second thin film transistor;

10 a pixel electrode formed over said substrate wherein said pixel electrode is connected to the other one of said second pair of impurity regions of said second thin film transistor; and

a driving circuit formed over said substrate for driving at least one of said first and second thin film transistors, said driving circuit comprising a third thin film transistor wherein a channel forming region of said third thin film transistor comprises crystalline silicon,

15 said method comprising a step of applying a voltage from said voltage supply line to said pixel electrode for a period during one frame, wherein said period is determined in accordance with a desired tone of a display.

13. An operation method of an active matrix device comprising:

a substrate having an insulating surface;

20 a first signal line extending over said substrate;

a first top-gate type thin film transistor having a channel region comprising crystalline silicon and a first pair of impurity regions formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;

25 a second signal line extending across said first signal line wherein said second signal line is connected to one of said first pair of impurity regions of said first thin film transistor;

a second top-gate type thin film transistor having a channel region comprising crystalline silicon and a second pair of impurity regions formed over said

substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;

a voltage supply line formed over said substrate wherein said voltage supply line is connected to one of said second pair of impurity regions of said second thin film transistor;

a surface smoothing film formed over said first and second thin film transistors;

a pixel electrode formed over said surface smoothing film wherein said pixel electrode is connected to the other one of said second pair of impurity regions of said second thin film transistor; and

a driving circuit formed over said substrate for driving at least one of said first and second thin film transistors, said driving circuit comprising a third thin film transistor wherein a channel forming region of said third thin film transistor comprises crystalline silicon,

said method comprising a step of applying a voltage from said voltage supply line to said pixel electrode for a period during one frame, wherein said period is determined in accordance with a desired tone of a display.

14. An operation method of an active matrix device comprising:

a substrate having an insulating surface;

a first signal line extending over said substrate;

a first bottom gate type thin film transistor having a channel region comprising crystalline silicon and a first pair of impurity regions formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;

a second signal line extending across said first signal line wherein said second signal line is connected to one of said first pair of impurity regions of said first thin film transistor;

a second bottom gate type thin film transistor having a channel region comprising crystalline silicon and a second pair of impurity regions formed over said

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substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;

5 a voltage supply line formed over said substrate wherein said voltage supply line is connected to one of said second pair of impurity regions of said second thin film transistor;

a surface smoothing film formed over said first and second thin film transistors;

10 a pixel electrode formed over said surface smoothing film wherein said pixel electrode is connected to the other one of said second pair of impurity regions of said second thin film transistor; and

a driving circuit formed over said substrate for driving at least one of said first and second thin film transistors, said driving circuit comprising a third thin film transistor wherein a channel forming region of said third thin film transistor comprises crystalline silicon,

15 said method comprising a step of applying a voltage from said voltage supply line to said pixel electrode for a period during one frame, wherein said period is determined in accordance with a desired tone of a display.

15. An operation method of an active matrix device comprising:

20 a substrate having an insulating surface;

a first signal line extending over said substrate;

a first thin film transistor having a channel region comprising crystalline silicon and a first pair of impurity regions formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;

25 a second signal line extending across said first signal line wherein said second signal line is connected to one of said first pair of impurity regions of said first thin film transistor;

a second thin film transistor having a channel region comprising crystalline silicon and a second pair of impurity regions formed over said substrate

wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;

5 a voltage supply line formed over said substrate wherein said voltage supply line is connected to one of said second pair of impurity regions of said second thin film transistor;

a surface smoothing film formed over said first and second thin film transistors;

10 a pixel electrode formed over said surface smoothing film wherein said pixel electrode is connected to the other one of said second pair of impurity regions of said second thin film transistor; and

a driving circuit formed over said substrate for driving at least one of said first and second thin film transistors, said driving circuit comprising a third thin film transistor wherein a channel forming region of said third thin film transistor comprises crystalline silicon,

15 said method comprising a step of applying a voltage from said voltage supply line to said pixel electrode for a period during one frame, wherein said period is determined in accordance with a desired tone of a display.

16. An operation method of an active matrix device comprising:

20 a substrate having an insulating surface;

a first signal line extending over said substrate;

a first top-gate type thin film transistor having a channel region comprising crystalline silicon and a first pair of impurity regions formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;

25 a second signal line extending across said first signal line wherein said second signal line is connected to one of said first pair of impurity regions of said first thin film transistor;

a second top-gate type thin film transistor having a channel region comprising crystalline silicon and a second pair of impurity regions formed over said

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substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;

a voltage supply line formed over said substrate wherein said voltage supply line is connected to one of said second pair of impurity regions of said second thin film transistor;

a pixel electrode formed over said substrate wherein said pixel electrode is connected to the other one of said second pair of impurity regions of said second thin film transistor; and

a driving circuit formed over said substrate for driving at least one of said first and second thin film transistors, said driving circuit comprising a third thin film transistor wherein a channel forming region of said third thin film transistor comprises crystalline silicon,

wherein a channel width of said second thin film transistor is larger than a channel width of said first thin film transistor,

said method comprising a step of applying a voltage from said voltage supply line to said pixel electrode for a period during one frame, wherein said period is determined in accordance with a desired tone of a display.

17. An operation method of an active matrix device comprising:

a substrate having an insulating surface;

a first signal line extending over said substrate;

a first bottom gate type thin film transistor having a channel region comprising crystalline silicon and a first pair of impurity regions formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;

a second signal line extending across said first signal line wherein said second signal line is connected to one of said first pair of impurity regions of said first thin film transistor;

a second bottom gate type thin film transistor having a channel region comprising crystalline silicon and a second pair of impurity regions formed over said

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substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;

5 a voltage supply line formed over said substrate wherein said voltage supply line is connected to one of said second pair of impurity regions of said second thin film transistor;

a pixel electrode formed over said substrate wherein said pixel electrode is connected to the other one of said second pair of impurity regions of said second thin film transistor; and

10 a driving circuit formed over said substrate for driving at least one of said first and second thin film transistors, said driving circuit comprising a third thin film transistor wherein a channel forming region of said third thin film transistor comprises crystalline silicon,

wherein a channel width of said second thin film transistor is larger than a channel width of said first thin film transistor,

15 said method comprising a step of applying a voltage from said voltage supply line to said pixel electrode for a period during one frame, wherein said period is determined in accordance with a desired tone of a display.

18. An operation method of an active matrix device comprising:

20 a substrate having an insulating surface;

a first signal line extending over said substrate;

a first thin film transistor having a channel region comprising crystalline silicon and a first pair of impurity regions formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;

25 a second signal line extending across said first signal line wherein said second signal line is connected to one of said first pair of impurity regions of said first thin film transistor;

a second thin film transistor having a channel region comprising crystalline silicon and a second pair of impurity regions formed over said substrate



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wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;

a voltage supply line formed over said substrate wherein said voltage supply line is connected to one of said second pair of impurity regions of said second thin film transistor;

a pixel electrode formed over said substrate wherein said pixel electrode is connected to the other one of said second pair of impurity regions of said second thin film transistor; and

a driving circuit formed over said substrate for driving at least one of said first and second thin film transistors, said driving circuit comprising a third thin film transistor wherein a channel forming region of said third thin film transistor comprises crystalline silicon,

wherein a channel width of said second thin film transistor is larger than a channel width of said first thin film transistor,

said method comprising a step of applying a voltage from said voltage supply line to said pixel electrode for a period during one frame, wherein said period is determined in accordance with a desired tone of a display.

19. An operation method of an active matrix device comprising:

a substrate having an insulating surface;

a first signal line extending over said substrate;

a first top-gate type thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;

a second signal line extending across said first signal line wherein said second signal line is connected to a drain of said first thin film transistor;

a second top-gate type thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;

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a voltage supply line formed over said substrate wherein said voltage supply line is connected to a drain of said second thin film transistor; and

a pixel electrode formed over said substrate wherein said pixel electrode is connected to a source of said second thin film transistor;

5 wherein a channel width of said second thin film transistor is larger than a channel width of said first thin film transistor,

said method comprising a step of applying a voltage from said voltage supply line to said pixel electrode for a period during one frame, wherein said period is determined in accordance with a desired tone of a display.

10 20. An operation method of an active matrix device comprising:

a substrate having an insulating surface;

a first signal line extending over said substrate;

15 a first bottom gate type thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;

a second signal line extending across said first signal line wherein said second signal line is connected to a drain of said first thin film transistor;

20 a second bottom gate type thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;

a voltage supply line formed over said substrate wherein said voltage supply line is connected to a drain of said second thin film transistor; and

25 a pixel electrode formed over said substrate wherein said pixel electrode is connected to a source of said second thin film transistor;

wherein a channel width of said second thin film transistor is larger than a channel width of said first thin film transistor,

said method comprising a step of applying a voltage from said voltage supply line to said pixel electrode for a period during one frame, wherein said period

is determined in accordance with a desired tone of a display.

21. An operation method of an active matrix device comprising:

a substrate having an insulating surface;

a first signal line extending over said substrate;

a first thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;

a second signal line extending across said first signal line wherein said second signal line is connected to a drain of said first thin film transistor;

a second thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;

a voltage supply line formed over said substrate wherein said voltage supply line is connected to a drain of said second thin film transistor; and

a pixel electrode formed over said substrate wherein said pixel electrode is connected to a source of said second thin film transistor;

wherein a channel width of said second thin film transistor is larger than a channel width of said first thin film transistor,

said method comprising a step of applying a voltage from said voltage supply line to said pixel electrode for a period during one frame, wherein said period is determined in accordance with a desired tone of a display.

22. An operation method of an active matrix device comprising:

a substrate having an insulating surface;

a first signal line extending over said substrate;

a first top-gate type thin film transistor having a channel region comprising crystalline silicon and a first pair of impurity regions formed over said

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substrate wherein a gate of said first thin film transistor is connected to said first signal line;

5 a second signal line extending across said first signal line wherein said second signal line is connected to one of said first pair of impurity regions of said first thin film transistor;

10 a second top-gate type thin film transistor having a channel region comprising crystalline silicon and a second pair of impurity regions formed over said substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;

15 a voltage supply line formed over said substrate wherein said voltage supply line is connected to one of said second pair of impurity regions of said second thin film transistor;

20 a pixel electrode formed over said substrate wherein said pixel electrode is connected to the other one of said second pair of impurity regions of said second thin film transistor; and

wherein a channel width of said second thin film transistor is larger than a channel width of said first thin film transistor,

25 said method comprising a step of applying a voltage from said voltage supply line to said pixel electrode for a period during one frame, wherein said period is determined in accordance with a desired tone of a display.

23. An operation method of an active matrix device comprising:

a substrate having an insulating surface;

a first signal line extending over said substrate;

25 a first bottom gate type thin film transistor having a channel region comprising crystalline silicon and a first pair of impurity regions formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;

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a second signal line extending across said first signal line wherein said second signal line is connected to one of said first pair of impurity regions of said first thin film transistor;

5 a second bottom gate type thin film transistor having a channel region comprising crystalline silicon and a second pair of impurity regions formed over said substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;

10 a voltage supply line formed over said substrate wherein said voltage supply line is connected to one of said second pair of impurity regions of said second thin film transistor;

a pixel electrode formed over said substrate wherein said pixel electrode is connected to the other one of said second pair of impurity regions of said second thin film transistor; and

15 wherein a channel width of said second thin film transistor is larger than a channel width of said first thin film transistor,

said method comprising a step of applying a voltage from said voltage supply line to said pixel electrode for a period during one frame, wherein said period is determined in accordance with a desired tone of a display.

20 24. An operation method of an active matrix device comprising:

a substrate having an insulating surface;

a first signal line extending over said substrate;

a first thin film transistor having a channel region comprising crystalline silicon and a first pair of impurity regions formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;

25 a second signal line extending across said first signal line wherein said second signal line is connected to one of said first pair of impurity regions of said first thin film transistor;

a second thin film transistor having a channel region comprising crystalline silicon and a second pair of impurity regions formed over said substrate

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- wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;
- a voltage supply line formed over said substrate wherein said voltage supply line is connected to one of said second pair of impurity regions of said second thin film transistor;
- a pixel electrode formed over said substrate wherein said pixel electrode is connected to the other one of said second pair of impurity regions of said second thin film transistor; and
- wherein a channel width of said second thin film transistor is larger than a channel width of said first thin film transistor,
- said method comprising a step of applying a voltage from said voltage supply line to said pixel electrode for a period during one frame, wherein said period is determined in accordance with a desired tone of a display.
25. An operation method of an active matrix device comprising:
- a substrate having an insulating surface;
- a first signal line extending over said substrate;
- a first top-gate type thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;
- a second signal line extending across said first signal line wherein said second signal line is connected to a drain of said first thin film transistor;
- a second top-gate type thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;
- a voltage supply line formed over said substrate wherein said voltage supply line is connected to a drain of said second thin film transistor;
- a pixel electrode formed over said substrate wherein said pixel electrode is connected to a source of said second thin film transistor; and

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5 a driving circuit formed over said substrate for driving at least one of said first and second thin film transistors, said driving circuit comprising a third thin film transistor wherein a channel forming region of said third thin film transistor comprises crystalline silicon,

10 said method comprising a step of applying one or more pulses from said voltage supply line to said pixel electrode during one frame wherein a number of pulses applied to said pixel electrode during one frame is determined in accordance with a desired tone of a display.

26. An operation method of an active matrix device comprising:
- 10 a substrate having an insulating surface;
  - a first signal line extending over said substrate;
  - a first bottom gate type thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;
  - 15 a second signal line extending across said first signal line wherein said second signal line is connected to a drain of said first thin film transistor;
  - a second bottom gate type thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at
  - 20 least said first thin film transistor;
  - a voltage supply line formed over said substrate wherein said voltage supply line is connected to a drain of said second thin film transistor;
  - a pixel electrode formed over said substrate wherein said pixel electrode is connected to a source of said second thin film transistor; and
  - 25 a driving circuit formed over said substrate for driving at least one of said first and second thin film transistors, said driving circuit comprising a third thin film transistor wherein a channel forming region of said third thin film transistor comprises crystalline silicon,

said method comprising a step of applying one or more pulses from said voltage supply line to said pixel electrode during one frame wherein a number of pulses applied to said pixel electrode during one frame is determined in accordance with a desired tone of a display.

- 5           27.   An operation method of an active matrix device comprising:
- a substrate having an insulating surface;
- a first signal line extending over said substrate;
- a first thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;
- 10           a second signal line extending across said first signal line wherein said second signal line is connected to a drain of said first thin film transistor;
- a second thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;
- 15           a voltage supply line formed over said substrate wherein said voltage supply line is connected to a drain of said second thin film transistor;
- a pixel electrode formed over said substrate wherein said pixel electrode is connected to a source of said second thin film transistor; and
- 20           a driving circuit formed over said substrate for driving at least one of said first and second thin film transistors, said driving circuit comprising a third thin film transistor wherein a channel forming region of said third thin film transistor comprises crystalline silicon,
- 25           said method comprising a step of applying one or more pulses from said voltage supply line to said pixel electrode during one frame wherein a number of pulses applied to said pixel electrode during one frame is determined in accordance with a desired tone of a display.



28. An operation method of an active matrix device comprising:  
a substrate having an insulating surface;  
a first signal line extending over said substrate;  
a first top-gate type thin film transistor having a channel region  
comprising crystalline silicon formed over said substrate wherein a gate of said first  
thin film transistor is connected to said first signal line;  
a second signal line extending across said first signal line wherein  
said second signal line is connected to a drain of said first thin film transistor;  
a second top-gate type thin film transistor having a channel region  
comprising crystalline silicon formed over said substrate wherein a signal is applied  
to a gate of said second thin film transistor from said second signal line through at  
least said first thin film transistor;  
a voltage supply line formed over said substrate wherein said voltage  
supply line is connected to a drain of said second thin film transistor;  
a surface smoothing film formed over said first and second thin film  
transistors;  
a pixel electrode formed over said surface smoothing film wherein  
said pixel electrode is connected to a source of said second thin film transistor; and  
a driving circuit formed over said substrate for driving at least one of  
said first and second thin film transistors, said driving circuit comprising a third thin  
film transistor wherein a channel forming region of said third thin film transistor  
comprises crystalline silicon,  
said method comprising a step of applying one or more pulses from  
said voltage supply line to said pixel electrode during one frame wherein a number  
of pulses applied to said pixel electrode during one frame is determined in  
accordance with a desired tone of a display.
29. An operation method of an active matrix device comprising:  
a substrate having an insulating surface;  
a first signal line extending over said substrate;

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a first bottom gate type thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;

5 a second signal line extending across said first signal line wherein said second signal line is connected to a drain of said first thin film transistor;

a second bottom gate type thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;

10 a voltage supply line formed over said substrate wherein said voltage supply line is connected to a drain of said second thin film transistor;

a surface smoothing film formed over said first and second thin film transistors;

15 a pixel electrode formed over said surface smoothing film wherein said pixel electrode is connected to a source of said second thin film transistor; and

a driving circuit formed over said substrate for driving at least one of said first and second thin film transistors, said driving circuit comprising a third thin film transistor wherein a channel forming region of said third thin film transistor comprises crystalline silicon,

20 said method comprising a step of applying one or more pulses from said voltage supply line to said pixel electrode during one frame wherein a number of pulses applied to said pixel electrode during one frame is determined in accordance with a desired tone of a display.

30. An operation method of an active matrix device comprising:

25 a substrate having an insulating surface;

a first signal line extending over said substrate;

a first thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;

a second signal line extending across said first signal line wherein said second signal line is connected to a drain of said first thin film transistor;

5 a second thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;

a voltage supply line formed over said substrate wherein said voltage supply line is connected to a drain of said second thin film transistor;

10 a surface smoothing film formed over said first and second thin film transistors;

a pixel electrode formed over said surface smoothing film wherein said pixel electrode is connected to a source of said second thin film transistor; and

15 a driving circuit formed over said substrate for driving at least one of said first and second thin film transistors, said driving circuit comprising a third thin film transistor wherein a channel forming region of said third thin film transistor comprises crystalline silicon,

20 said method comprising a step of applying one or more pulses from said voltage supply line to said pixel electrode during one frame wherein a number of pulses applied to said pixel electrode during one frame is determined in accordance with a desired tone of a display.

31. An operation method of an active matrix device comprising:

a substrate having an insulating surface;

a first signal line extending over said substrate;

25 a first top-gate type thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;

a second signal line extending across said first signal line wherein said second signal line is connected to a drain of said first thin film transistor;

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a second top-gate type thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;

5 a voltage supply line formed over said substrate wherein said voltage supply line is connected to a drain of said second thin film transistor;

a pixel electrode formed over said substrate wherein said pixel electrode is connected to a source of said second thin film transistor; and

10 a driving circuit formed over said substrate for driving at least one of said first and second thin film transistors, said driving circuit comprising a third thin film transistor wherein a channel forming region of said third thin film transistor comprises crystalline silicon,

wherein a channel width of said second thin film transistor is larger than a channel width of said first thin film transistor,

15 said method comprising a step of applying one or more pulses from said voltage supply line to said pixel electrode during one frame wherein a number of pulses applied to said pixel electrode during one frame is determined in accordance with a desired tone of a display.

32. An operation method of an active matrix device comprising:

20 a substrate having an insulating surface;

a first signal line extending over said substrate;

a first bottom gate type thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;

25 a second signal line extending across said first signal line wherein said second signal line is connected to a drain of said first thin film transistor;

a second bottom gate type thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a signal is applied

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to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;

a voltage supply line formed over said substrate wherein said voltage supply line is connected to a drain of said second thin film transistor;

5 a pixel electrode formed over said substrate wherein said pixel electrode is connected to a source of said second thin film transistor; and

a driving circuit formed over said substrate for driving at least one of said first and second thin film transistors, said driving circuit comprising a third thin film transistor wherein a channel forming region of said third thin film transistor comprises crystalline silicon,

10 wherein a channel width of said second thin film transistor is larger than a channel width of said first thin film transistor,

said method comprising a step of applying one or more pulses from said voltage supply line to said pixel electrode during one frame wherein a number of pulses applied to said pixel electrode during one frame is determined in accordance with a desired tone of a display.

33. An operation method of an active matrix device comprising:

a substrate having an insulating surface;

a first signal line extending over said substrate;

20 a first thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;

a second signal line extending across said first signal line wherein said second signal line is connected to a drain of said first thin film transistor;

25 a second thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;

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a voltage supply line formed over said substrate wherein said voltage supply line is connected to a drain of said second thin film transistor;

a pixel electrode formed over said substrate wherein said pixel electrode is connected to a source of said second thin film transistor; and

5 a driving circuit formed over said substrate for driving at least one of said first and second thin film transistors, said driving circuit comprising a third thin film transistor wherein a channel forming region of said third thin film transistor comprises crystalline silicon,

10 wherein a channel width of said second thin film transistor is larger than a channel width of said first thin film transistor,

said method comprising a step of applying one or more pulses from said voltage supply line to said pixel electrode during one frame wherein a number of pulses applied to said pixel electrode during one frame is determined in accordance with a desired tone of a display.

15 34. An operation method of an active matrix device comprising:

a substrate having an insulating surface;

a first signal line extending over said substrate;

20 a first top-gate type thin film transistor having a channel region comprising crystalline silicon and a first pair of impurity regions formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;

a second signal line extending across said first signal line wherein said second signal line is connected to one of said first pair of impurity regions of said first thin film transistor;

25 a second top-gate type thin film transistor having a channel region comprising crystalline silicon and a second pair of impurity regions formed over said substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;

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a voltage supply line formed over said substrate wherein said voltage supply line is connected to one of said second pair of impurity regions of said second thin film transistor;

5 a pixel electrode formed over said substrate wherein said pixel electrode is connected to the other one of said second pair of impurity regions of said second thin film transistor; and

10 a driving circuit formed over said substrate for driving at least one of said first and second thin film transistors, said driving circuit comprising a third thin film transistor wherein a channel forming region of said third thin film transistor comprises crystalline silicon,

said method comprising a step of applying one or more pulses from said voltage supply line to said pixel electrode during one frame wherein a number of pulses applied to said pixel electrode during one frame is determined in accordance with a desired tone of a display.

15 35. An operation method of an active matrix device comprising:

a substrate having an insulating surface;

a first signal line extending over said substrate;

20 a first bottom gate type thin film transistor having a channel region comprising crystalline silicon and a first pair of impurity regions formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;

a second signal line extending across said first signal line wherein said second signal line is connected to one of said first pair of impurity regions of said first thin film transistor;

25 a second bottom gate type thin film transistor having a channel region comprising crystalline silicon and a second pair of impurity regions formed over said substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;

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a voltage supply line formed over said substrate wherein said voltage supply line is connected to one of said second pair of impurity regions of said second thin film transistor;

5 a pixel electrode formed over said substrate wherein said pixel electrode is connected to the other one of said second pair of impurity regions of said second thin film transistor; and

10 a driving circuit formed over said substrate for driving at least one of said first and second thin film transistors, said driving circuit comprising a third thin film transistor wherein a channel forming region of said third thin film transistor comprises crystalline silicon,

said method comprising a step of applying one or more pulses from said voltage supply line to said pixel electrode during one frame wherein a number of pulses applied to said pixel electrode during one frame is determined in accordance with a desired tone of a display.

15 36. An operation method of an active matrix device comprising:

a substrate having an insulating surface;

a first signal line extending over said substrate;

20 a first thin film transistor having a channel region comprising crystalline silicon and a first pair of impurity regions formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;

a second signal line extending across said first signal line wherein said second signal line is connected to one of said first pair of impurity regions of said first thin film transistor;

25 a second thin film transistor having a channel region comprising crystalline silicon and a second pair of impurity regions formed over said substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;



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a voltage supply line formed over said substrate wherein said voltage supply line is connected to one of said second pair of impurity regions of said second thin film transistor;

5 a pixel electrode formed over said substrate wherein said pixel electrode is connected to the other one of said second pair of impurity regions of said second thin film transistor; and

10 a driving circuit formed over said substrate for driving at least one of said first and second thin film transistors, said driving circuit comprising a third thin film transistor wherein a channel forming region of said third thin film transistor comprises crystalline silicon,

said method comprising a step of applying one or more pulses from said voltage supply line to said pixel electrode during one frame wherein a number of pulses applied to said pixel electrode during one frame is determined in accordance with a desired tone of a display.

15 37. An operation method of an active matrix device comprising:

a substrate having an insulating surface;

a first signal line extending over said substrate;

20 a first top-gate type thin film transistor having a channel region comprising crystalline silicon and a first pair of impurity regions formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;

a second signal line extending across said first signal line wherein said second signal line is connected to one of said first pair of impurity regions of said first thin film transistor;

25 a second top-gate type thin film transistor having a channel region comprising crystalline silicon and a second pair of impurity regions formed over said substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;

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a voltage supply line formed over said substrate wherein said voltage supply line is connected to one of said second pair of impurity regions of said second thin film transistor;

5 a surface smoothing film formed over said first and second thin film transistors;

a pixel electrode formed over said surface smoothing film wherein said pixel electrode is connected to the other one of said second pair of impurity regions of said second thin film transistor; and

10 a driving circuit formed over said substrate for driving at least one of said first and second thin film transistors, said driving circuit comprising a third thin film transistor wherein a channel forming region of said third thin film transistor comprises crystalline silicon,

15 said method comprising a step of applying one or more pulses from said voltage supply line to said pixel electrode during one frame wherein a number of pulses applied to said pixel electrode during one frame is determined in accordance with a desired tone of a display.

38. An operation method of an active matrix device comprising:

20 a substrate having an insulating surface;  
a first signal line extending over said substrate;  
a first bottom gate type thin film transistor having a channel region comprising crystalline silicon and a first pair of impurity regions formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;

25 a second signal line extending across said first signal line wherein said second signal line is connected to one of said first pair of impurity regions of said first thin film transistor;

a second bottom gate type thin film transistor having a channel region comprising crystalline silicon and a second pair of impurity regions formed over said

substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;

5 a voltage supply line formed over said substrate wherein said voltage supply line is connected to one of said second pair of impurity regions of said second thin film transistor;

a surface smoothing film formed over said first and second thin film transistors;

10 a pixel electrode formed over said surface smoothing film wherein said pixel electrode is connected to the other one of said second pair of impurity regions of said second thin film transistor; and

a driving circuit formed over said substrate for driving at least one of said first and second thin film transistors, said driving circuit comprising a third thin film transistor wherein a channel forming region of said third thin film transistor comprises crystalline silicon,

15 said method comprising a step of applying one or more pulses from said voltage supply line to said pixel electrode during one frame wherein a number of pulses applied to said pixel electrode during one frame is determined in accordance with a desired tone of a display.

39. An operation method of an active matrix device comprising:

20 a substrate having an insulating surface;

a first signal line extending over said substrate;

a first thin film transistor having a channel region comprising crystalline silicon and a first pair of impurity regions formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;

25 a second signal line extending across said first signal line wherein said second signal line is connected to one of said first pair of impurity regions of said first thin film transistor;

a second thin film transistor having a channel region comprising crystalline silicon and a second pair of impurity regions formed over said substrate

wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;

5 a voltage supply line formed over said substrate wherein said voltage supply line is connected to one of said second pair of impurity regions of said second thin film transistor;

a surface smoothing film formed over said first and second thin film transistors;

10 a pixel electrode formed over said surface smoothing film wherein said pixel electrode is connected to the other one of said second pair of impurity regions of said second thin film transistor; and

a driving circuit formed over said substrate for driving at least one of said first and second thin film transistors, said driving circuit comprising a third thin film transistor wherein a channel forming region of said third thin film transistor comprises crystalline silicon,

15 said method comprising a step of applying one or more pulses from said voltage supply line to said pixel electrode during one frame wherein a number of pulses applied to said pixel electrode during one frame is determined in accordance with a desired tone of a display.

40. An operation method of an active matrix device comprising:

20 a substrate having an insulating surface;

a first signal line extending over said substrate;

25 a first top-gate type thin film transistor having a channel region comprising crystalline silicon and a first pair of impurity regions formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;

a second signal line extending across said first signal line wherein said second signal line is connected to one of said first pair of impurity regions of said first thin film transistor;

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a second top-gate type thin film transistor having a channel region comprising crystalline silicon and a second pair of impurity regions formed over said substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;

5 a voltage supply line formed over said substrate wherein said voltage supply line is connected to one of said second pair of impurity regions of said second thin film transistor;

10 a pixel electrode formed over said substrate wherein said pixel electrode is connected to the other one of said second pair of impurity regions of said second thin film transistor; and

a driving circuit formed over said substrate for driving at least one of said first and second thin film transistors, said driving circuit comprising a third thin film transistor wherein a channel forming region of said third thin film transistor comprises crystalline silicon,

15 wherein a channel width of said second thin film transistor is larger than a channel width of said first thin film transistor,

said method comprising a step of applying one or more pulses from said voltage supply line to said pixel electrode during one frame wherein a number of pulses applied to said pixel electrode during one frame is determined in accordance with a desired tone of a display.

20 41. An operation method of an active matrix device comprising:  
a substrate having an insulating surface;  
a first signal line extending over said substrate;  
a first bottom gate type thin film transistor having a channel region  
25 comprising crystalline silicon and a first pair of impurity regions formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;

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a second signal line extending across said first signal line wherein said second signal line is connected to one of said first pair of impurity regions of said first thin film transistor;

5 a second bottom gate type thin film transistor having a channel region comprising crystalline silicon and a second pair of impurity regions formed over said substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;

10 a voltage supply line formed over said substrate wherein said voltage supply line is connected to one of said second pair of impurity regions of said second thin film transistor;

a pixel electrode formed over said substrate wherein said pixel electrode is connected to the other one of said second pair of impurity regions of said second thin film transistor; and

15 a driving circuit formed over said substrate for driving at least one of said first and second thin film transistors, said driving circuit comprising a third thin film transistor wherein a channel forming region of said third thin film transistor comprises crystalline silicon,

wherein a channel width of said second thin film transistor is larger than a channel width of said first thin film transistor,

20 said method comprising a step of applying one or more pulses from said voltage supply line to said pixel electrode during one frame wherein a number of pulses applied to said pixel electrode during one frame is determined in accordance with a desired tone of a display.

25 42. An operation method of an active matrix device comprising:

a substrate having an insulating surface;

a first signal line extending over said substrate;

a first thin film transistor having a channel region comprising crystalline silicon and a first pair of impurity regions formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;

a second signal line extending across said first signal line wherein said second signal line is connected to one of said first pair of impurity regions of said first thin film transistor;

5 a second thin film transistor having a channel region comprising crystalline silicon and a second pair of impurity regions formed over said substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;

10 a voltage supply line formed over said substrate wherein said voltage supply line is connected to one of said second pair of impurity regions of said second thin film transistor;

a pixel electrode formed over said substrate wherein said pixel electrode is connected to the other one of said second pair of impurity regions of said second thin film transistor; and

15 a driving circuit formed over said substrate for driving at least one of said first and second thin film transistors, said driving circuit comprising a third thin film transistor wherein a channel forming region of said third thin film transistor comprises crystalline silicon,

20 wherein a channel width of said second thin film transistor is larger than a channel width of said first thin film transistor,

said method comprising a step of applying one or more pulses from said voltage supply line to said pixel electrode during one frame wherein a number of pulses applied to said pixel electrode during one frame is determined in accordance with a desired tone of a display.

25 43. An operation method of an active matrix device comprising:

a substrate having an insulating surface;

a first signal line extending over said substrate;

a first top-gate type thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;

a second signal line extending across said first signal line wherein said second signal line is connected to a drain of said first thin film transistor;

5 a second top-gate type thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;

a voltage supply line formed over said substrate wherein said voltage supply line is connected to a drain of said second thin film transistor; and

10 a pixel electrode formed over said substrate wherein said pixel electrode is connected to a source of said second thin film transistor;

wherein a channel width of said second thin film transistor is larger than a channel width of said first thin film transistor,

15 said method comprising a step of applying one or more pulses from said voltage supply line to said pixel electrode during one frame wherein a number of pulses applied to said pixel electrode during one frame is determined in accordance with a desired tone of a display.

44. An operation method of an active matrix device comprising:

a substrate having an insulating surface;

a first signal line extending over said substrate;

20 a first bottom gate type thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;

a second signal line extending across said first signal line wherein said second signal line is connected to a drain of said first thin film transistor;

25 a second bottom gate type thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;

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a voltage supply line formed over said substrate wherein said voltage supply line is connected to a drain of said second thin film transistor; and

a pixel electrode formed over said substrate wherein said pixel electrode is connected to a source of said second thin film transistor;

5 wherein a channel width of said second thin film transistor is larger than a channel width of said first thin film transistor,

said method comprising a step of applying one or more pulses from said voltage supply line to said pixel electrode during one frame wherein a number of pulses applied to said pixel electrode during one frame is determined in  
10 accordance with a desired tone of a display.

45. An operation method of an active matrix device comprising:

a substrate having an insulating surface;

a first signal line extending over said substrate;

15 a first thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;

a second signal line extending across said first signal line wherein said second signal line is connected to a drain of said first thin film transistor;

20 a second thin film transistor having a channel region comprising crystalline silicon formed over said substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;

a voltage supply line formed over said substrate wherein said voltage supply line is connected to a drain of said second thin film transistor; and

25 a pixel electrode formed over said substrate wherein said pixel electrode is connected to a source of said second thin film transistor;

wherein a channel width of said second thin film transistor is larger than a channel width of said first thin film transistor,

said method comprising a step of applying one or more pulses from said voltage supply line to said pixel electrode during one frame wherein a number of pulses applied to said pixel electrode during one frame is determined in accordance with a desired tone of a display.

- 5           46.    An operation method of an active matrix device comprising:
- a substrate having an insulating surface;
- a first signal line extending over said substrate;
- a first top-gate type thin film transistor having a channel region comprising crystalline silicon and a first pair of impurity regions formed over said
- 10           substrate wherein a gate of said first thin film transistor is connected to said first signal line;
- a second signal line extending across said first signal line wherein said second signal line is connected to one of said first pair of impurity regions of said first thin film transistor;
- 15           a second top-gate type thin film transistor having a channel region comprising crystalline silicon and a second pair of impurity regions formed over said substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;
- a voltage supply line formed over said substrate wherein said voltage
- 20           supply line is connected to one of said second pair of impurity regions of said second thin film transistor;
- a pixel electrode formed over said substrate wherein said pixel electrode is connected to the other one of said second pair of impurity regions of said second thin film transistor; and
- 25           wherein a channel width of said second thin film transistor is larger than a channel width of said first thin film transistor,
- said method comprising a step of applying one or more pulses from said voltage supply line to said pixel electrode during one frame wherein a number

of pulses applied to said pixel electrode during one frame is determined in accordance with a desired tone of a display.

47. An operation method of an active matrix device comprising:

a substrate having an insulating surface;

a first signal line extending over said substrate;

a first bottom gate type thin film transistor having a channel region comprising crystalline silicon and a first pair of impurity regions formed over said substrate wherein a gate of said first thin film transistor is connected to said first signal line;

a second signal line extending across said first signal line wherein said second signal line is connected to one of said first pair of impurity regions of said first thin film transistor;

a second bottom gate type thin film transistor having a channel region comprising crystalline silicon and a second pair of impurity regions formed over said substrate wherein a signal is applied to a gate of said second thin film transistor from said second signal line through at least said first thin film transistor;

a voltage supply line formed over said substrate wherein said voltage supply line is connected to one of said second pair of impurity regions of said second thin film transistor;

a pixel electrode formed over said substrate wherein said pixel electrode is connected to the other one of said second pair of impurity regions of said second thin film transistor; and

wherein a channel width of said second thin film transistor is larger than a channel width of said first thin film transistor,

said method comprising a step of applying one or more pulses from said voltage supply line to said pixel electrode during one frame wherein a number of pulses applied to said pixel electrode during one frame is determined in accordance with a desired tone of a display.

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48. An operation method of an active matrix device comprising:  
a substrate having an insulating surface;  
a first signal line extending over said substrate;  
a first thin film transistor having a channel region comprising  
5 crystalline silicon and a first pair of impurity regions formed over said substrate  
wherein a gate of said first thin film transistor is connected to said first signal line;  
a second signal line extending across said first signal line wherein  
said second signal line is connected to one of said first pair of impurity regions of  
said first thin film transistor;  
10 a second thin film transistor having a channel region comprising  
crystalline silicon and a second pair of impurity regions formed over said substrate  
wherein a signal is applied to a gate of said second thin film transistor from said  
second signal line through at least said first thin film transistor;  
a voltage supply line formed over said substrate wherein said voltage  
15 supply line is connected to one of said second pair of impurity regions of said second  
thin film transistor;  
a pixel electrode formed over said substrate wherein said pixel  
electrode is connected to the other one of said second pair of impurity regions of said  
second thin film transistor; and  
20 wherein a channel width of said second thin film transistor is larger  
than a channel width of said first thin film transistor,  
said method comprising a step of applying one or more pulses from  
said voltage supply line to said pixel electrode during one frame wherein a number  
of pulses applied to said pixel electrode during one frame is determined in  
25 accordance with a desired tone of a display.

49. The method according to claim 12 wherein said active matrix device  
is a liquid crystal device.

50. The method according to claim 49 wherein each of said first and second thin film transistors is a top-gate transistor.

51. The method according to claim 49 wherein each of said first and second thin film transistors is a bottom-gate transistor.

52. The method according to claim 36 wherein said active matrix device is a liquid crystal device.

53. The method according to claim 52 wherein each of said first and second thin film transistors is a top-gate transistor.

54. The method according to claim 52 wherein each of said first and second thin film transistors is a bottom-gate transistor.

55. The method according to claim 3 wherein said active matrix device is a liquid crystal device.

56. The method according to claim 6 wherein said active matrix device is a liquid crystal device.

57. The method according to claim 9 wherein said active matrix device is a liquid crystal device.

58. The method according to claim 15 wherein said active matrix device is a liquid crystal device.

59. The method according to claim 18 wherein said active matrix device is a liquid crystal device.

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60. The method according to claim 27 wherein said active matrix device is a liquid crystal device.

61. The method according to claim 30 wherein said active matrix device is a liquid crystal device.

5 62. The method according to claim 33 wherein said active matrix device is a liquid crystal device.

63. The method according to claim 36 wherein said active matrix device is a liquid crystal device.

10 64. The method according to claim 39 wherein said active matrix device is a liquid crystal device.

65. The method according to claim 42 wherein said active matrix device is a liquid crystal device.

66. The method according to claim 45 wherein said active matrix device is a liquid crystal device.